



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/743,854

12/22/2003

Kunitake Matsushita

31647-5

9104

7590

08/03/2005

Mitchell P. Brook, Esq.
LUCE, FORWARD, HAMILTON & SCRIPPS LLP
11988 El Camino Real, Suite 200
San Diego, CA 92130

EXAMINER

MULLINS, BURTON S

ART UNIT

PAPER NUMBER

2834

DATE MAILED: 08/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

Office Action Summary	Application No.	Applicant(s)	
	10/743,854	MATSUSHITA ET AL.	
	Examiner	Art Unit	
	Burton S. Mullins	2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 July 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2,3 and 6-12 is/are rejected.
- 7) ☒ Claim(s) 4 and 5 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Allowable Subject Matter

1. The indicated allowability of claims 2, 6 and 9-10 is withdrawn in view of the newly discovered references cited in applicant's IDS statements filed April 25 and July 27, 2005.

Prosecution on the merits of this application is reopened and rejections based on the newly cited references follow.

Information Disclosure Statement

2. The information disclosure statements submitted on 25 April and 27 July 2005 have been considered by the examiner. It is noted that JP 6-070482 cited in the Japanese office action as teaching a resin-integrated rotor and shaft member (Ref.No.4) does not appear, in fact, to teach this limitation but instead teaches a power generating equipment circuit. Applicant is requested to review that the citation is correct and, if not, to submit the correct document.

Response to Amendment

3. In order to expedite prosecution, the after-final amendment filed July 5th, 2005, has been entered.

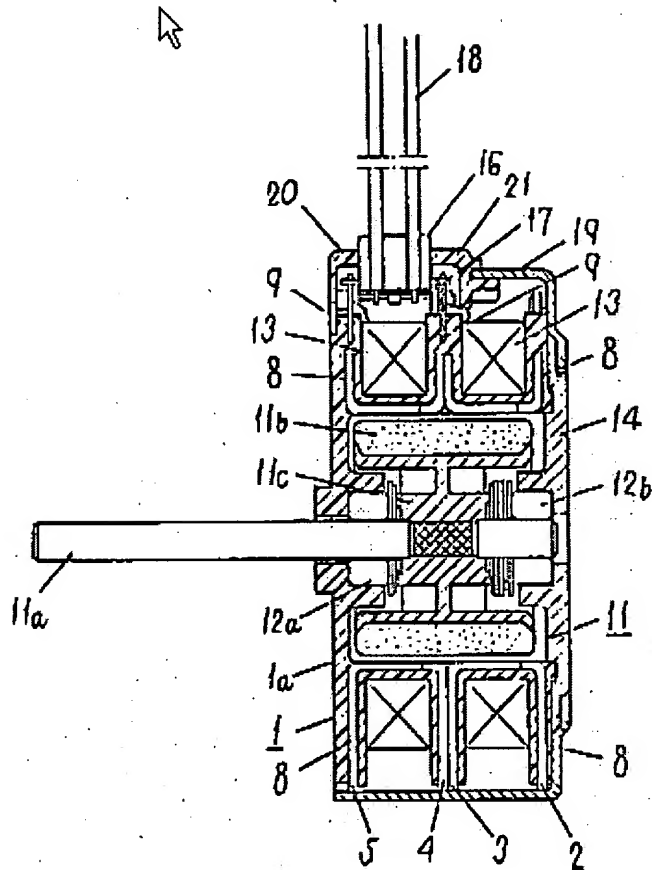
Claim Objections

4. Claim 3 is objected to because of the following informalities: The phrase "adapted to press the one end of the shaft by a rotatable ball" is not idiomatic. Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 2, 7 and 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Akiba et al. (US 4,714,850) in view of Tanaka (US 4,015,154), further in view of Horberg (US 3,001,839). With reference to the marked Figure 2 below, Akiba teaches a stepping motor comprising: a rotor 11 including a shaft 11a and a magnet 11b surrounding a portion of the shaft (Fig.2); a stator 1 surrounding the magnet of the rotor with a gap therebetween (not numbered, Fig.2), and adapted to generate a magnetic field thereby causing the rotor to rotate around an axis of the shaft (inherent); a rotor sleeve 11c having a cylindrical portion (not numbered, Fig.2) and a flange (not numbered, Fig.2) provided at one end of the cylindrical portion, the rotor sleeve 11c being provided between the magnet 11b and the shaft 11a so as to fixedly hold the magnet and the shaft together (Fig.2); a boss (holding part) 1a having a circular shape with a center hole (not numbered; Fig.2) for allowing the shaft 11a to rotatably pass therethrough and being formed (by monolithic resin molding) with the stator 1 (c.3, lines 37-51) so as to oppose the flange of the rotor sleeve (Fig.2); and a bearing 12a rotatably disposed between the boss and flange of the rotor sleeve (Fig.2).

Fig. 2.

Akiba does not teach: 1) ball bearings, per se, for the bearing 12a; or 2) an inner surface of the boss beveled to form a conical configuration with a diameter increasing from the center hole of the boss.⁷

Regarding (1), Tanaka teaches a molded motor including a boss molded with the stator (Fig. 5) and further including a concave portion 22a for receiving a ball bearing which rotatably supports the rotor shaft 4 (c.6, lines 5-10).

Art Unit: 2834

Regarding (2), Horberg teaches a motor including a bearing structure with sockets 30/31 (Fig.2) formed with an inclined (conical) surface with a diameter increasing from the center hole of the boss, for shiftably receiving the bearings 37/38 and facilitating bearing pre-loading (c.1, lines 40-54).

It would have been obvious to modify Akiba and provide ball bearings per Tanaka as the bearings of since the ball bearings would have been desirable to support the rotor shaft; and further to provide a conical surface on the boss per Horberg so as to facilitate bearing pre-loading.

Regarding claim 7, Akiba's rotor sleeve 11c is resin (c.3, line 55); therefore, it is "formed by resin-molding such that the resin is filled between the magnet and the shaft and cured".

Regarding claim 11, the boss is resin-molded integrally with the stator in Akiba (c.3, lines 37-51).

6. Claim 3, as best understood, is rejected under 35 U.S.C. 103(a) as being unpatentable over Akiba, Tanaka and Horberg, as applied to claim 2 above, further in view of Nagata et al. (JP 07-075322). Akiba and Tanaka substantially teach applicant's invention but do not specifically teach a thrust spring.

Nagata teaches a thrust spring 16 for reducing shaft vibration (Figs.1&3).

It would have been obvious to provide a thrust spring per Nagata on the motor of Akiba, Tanaka and Horberg to reduce shaft vibration.

7. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable unpatentable over Akiba, Tanaka and Horberg as applied to claim 2 above, further in view of Yuuichi (JP 06-

Art Unit: 2834

098522). Neither Akiba, Tanaka nor Horberg teach that the other end of the shaft is rotatably supported by a sleeve bearing.

Yuuichi teaches a stepping motor including a shaft 38, the end opposite the motor rotatably supported by a sleeve bearing 34b (Fig.1) so that the lead screw 38a may freely rotate and prevent noise (abstract).

It would have been obvious to modify Akiba, Tanaka and Horberg and provide a lead screw shaft end supported by a sleeve bearing per Yuuichi since this would have been desirable to allow the lead screw to freely rotate and to prevent noise.

8. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable unpatentable over Akiba, Tanaka and Horberg as applied to claim 2 above, further in view of Lee (US 6,208,046). Neither Akiba, Tanaka nor Horberg teach a spiral ridge on the exposed portion of the shaft.

Lee teaches a stepping motor with a lead screw 22 with spiral ridges formed on an exposed portion of shaft 20 (Fig.3). When the rotating shaft is actuated by the stator coils, the lead screw enables a pick-up unit to axially reciprocate along the lead screw (c.1, lines 15-23; c.7, lines 1-5).

It would have been obvious to modify Akiba, Tanaka and Horberg and provide a lead screw per Lee since this would have been desirable to allow a pick-up unit to axially reciprocate.

9. Claims 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable unpatentable over Akiba, Tanaka and Horberg as applied to claim 2 above, further in view of Takemoto et al. (JP 07-203666). Neither Akiba, Tanaka nor Horberg teach a spiral ridge on the exposed portion of the shaft formed of resin.

Takemoto teaches a rotor shaft comprising a lead screw 31 with a spiral ridge formed of resin (abstract) to improve dimensional accuracy and high accuracy feeding (abstract).

It would have been obvious to modify Akiba, Tanaka and Horberg and provide a molded resin lead screw per Takemoto since the lead screw would have enabled the motor to have high accuracy when used in a feeding application and the resin molding would have provided improved dimensional accuracy of the shaft and spiral ridge.

Regarding claim 10, the claim's process limitation has not been given patentable weight. In a product-by-process claim, if the prior art structure discloses the claimed product, then it meets the claim. Here, Akiba's rotor sleeve and magnet is identical to the claimed product.

10. Claims 2 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takemoto et al. (JP 11-2351) in view of Horberg (US 3,001,839). Takemoto teaches a valve stepping motor comprising: a rotor 16 including a shaft 17 and a magnet 15 surrounding a portion of the shaft (Fig.1); a stator 9/11 surrounding the magnet of the rotor with a gap therebetween (not numbered, Fig.1), and adapted to generate a magnetic field thereby causing the rotor to rotate around an axis of the shaft (inherent); a rotor sleeve 13 having a cylindrical portion (not numbered, Fig.1) and a flange (not numbered, Fig.1) provided at one end of the cylindrical portion, the rotor sleeve 13 being provided between the magnet 15 and the shaft 17 so as to fixedly hold the magnet and the shaft together (Fig.2); a boss (inner bush) 3 having a circular shape with a center hole (not numbered; Fig.1) for allowing the shaft 17 to rotatably pass therethrough and being formed with the stator 9/11, i.e., integral and connected therewith, so as to oppose the flange of the rotor sleeve 13 (Fig.1); and a thrust ball bearing 18 rotatably disposed between the boss and flange of the rotor sleeve (Fig.1).

Art Unit: 2834

Takemoto does not teach an inner surface of the boss beveled to form a conical configuration with a diameter increasing from the center hole of the boss.

Horberg teaches a motor including a bearing structure with sockets 30/31 (Fig.2) formed with an inclined (conical) surface with a diameter increasing from the center hole of the boss, for shiftably receiving the bearings 37/38 and facilitating bearing pre-loading (c.1, lines 40-54).

It would have been obvious to modify Takemoto and provide a conical surface on the boss per Horberg so as to facilitate bearing pre-loading.

11. Claim 3, as best understood, is rejected under 35 U.S.C. 103(a) as being unpatentable over Takemoto and Horberg, further in view of Ozawa et al. (JP 2002-101588). Takemoto and Horberg substantially teach applicant's invention but do not specifically teach a thrust spring.

Ozawa teaches a stepper motor with a thrust spring 26/27 that bears against shaft end and rotatable ball 6 for reducing shaft vibration (Figs.1,3&7).

It would have been obvious to provide a thrust spring per Ozawa on the motor of Takemoto and Horberg to reduce shaft vibration.

12. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable unpatentable over Takemoto and Horberg as applied to claim 2 above, further in view of Yuuichi (JP 06-098522). Neither Takemoto nor Horberg teach that the other end of the shaft is rotatably supported by a sleeve bearing.

Yuuichi teaches a stepping motor including a shaft 38, the end opposite the motor rotatably supported by a sleeve bearing 34b (Fig.1) so that the lead screw 38a may freely rotate and prevent noise (abstract).

Art Unit: 2834

It would have been obvious to modify Takemoto and Horberg and provide a lead screw shaft end supported by a sleeve bearing per Yuuichi since this would have been desirable to allow the lead screw to freely rotate and to prevent noise.

13. Claims 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takemoto and Horberg as applied to claim 2 above, further in view of Takemoto et al. (JP 07-203666). Neither Takemoto (JP '588) nor Horberg teach a spiral ridge on the exposed portion of the shaft formed of resin.

Takemoto (JP '666) teaches a rotor shaft comprising a lead screw 31 with a spiral ridge formed of resin (abstract) to improve dimensional accuracy and high accuracy feeding (abstract).

It would have been obvious to modify Takemoto (JP '588) and Horberg and provide a molded resin lead screw per Takemoto (JP '666) since the lead screw would have enabled the motor to have high accuracy when used in a feeding application and the resin molding would have provided improved dimensional accuracy of the shaft and spiral ridge.

Regarding claim 10, the claim's process limitation has not been given patentable weight. In a product-by-process claim, if the prior art structure discloses the claimed product, then it meets the claim. Here, the rotor sleeve and magnet in Takemoto (JP '588) is identical to the claimed product.

Allowable Subject Matter

14. Claims 4-5 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The prior art does not teach the claimed motor including: plural partitioning protrusions formed on the flange (claim 4); plural partitioning protrusions formed on an inner surface of the boss (claim 5).

Response to Arguments

15. Applicant's arguments have been considered but are moot in view of the new grounds of rejection.

Conclusion

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Burton S. Mullins whose telephone number is 571-272-2029. The examiner can normally be reached on Monday-Friday, 9 am to 5 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Darren Schuberg can be reached on 571-272-2044. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2834

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Burton S. Mullins
Primary Examiner
Art Unit 2834

bsm

01 August 2005